

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In a computer device that includes a display for displaying a graphical user interface that includes a pointer, a pointer input device, and an operating system, a method of assisting users in aligning a selected object with an object displayed on the graphical user interface comprising:

(a) in response to receiving notice of a pointer movement event, obtaining the current and projected coordinate positions of the pointer;

(b) determining if the pointer will intersect an alignment area during movement;

(c) if the pointer intersects an alignment area during movement, calculating an adjusted coordinate position for the pointer; and

(d) replacing the projected coordinate position of the pointer with the adjusted coordinate position.

2. The method of Claim 1 further comprising communicating to the operating system of the computer device that the pointer will achieve an aligned coordinate position if the pointer intersects an alignment area.

3. The method of Claim 1 further comprising displaying the pointer on the display of the computer device at the adjusted coordinate position.

4. The method of Claim 1, wherein the current and projected coordinate positions of the pointer are obtained from the operating system of the computer device.

5. The method of Claim 1, wherein determining if the pointer will intersect an alignment area includes:

(a) identifying the coordinate positions on the display of the computer device occupied by an alignment area; and

(b) comparing the coordinate position occupied by the alignment area with the movement of the pointer from the current to the projected coordinate positions.

6. The method of Claim 1, wherein the alignment area that a pointer may intersect is aligned with an object displayed on a graphical user interface.

7. The method of Claim 1, wherein calculating an adjusted coordinate position for the pointer includes:

(a) calculating the coordinate position where the pointer intersects the alignment area; and

(b) for each directional component in the projected movement of the pointer from the current to the projected coordinate positions ("projected movement"):

(i) determining the projected change in pointer location;

(ii) determining an adjustment amount based on the attributes of the alignment area; and

(iii) reducing the projected change in pointer location by said adjustment amount.

8. The method of Claim 7, wherein calculating the coordinate position where the pointer intersects an alignment area includes:

(a) identifying the coordinate position occupied by the alignment area; and

(b) comparing the coordinate position occupied by the alignment area with the projected movement of the pointer.

9. The method of Claim 7, wherein determining the projected change in pointer location includes:

(a) calculating the projected movement of the pointer; and

(b) expressing the projected movement of the pointer as a vector.

10. The method of Claim 7, wherein determining an adjustment amount includes:

(a) calculating the total amount of resistance generated by the alignment area;

(b) if the total amount of resistance is larger than the projected change in pointer location, determining that the adjustment amount equals the total amount of resistance; and

(c) alternatively if the total amount of resistance is not larger than the projected change in pointer location, determining the adjustment amount by calculating the point on a directional friction curve where the projected pointer movement equals the area under the directional friction curve.

11. The method of Claim 10, wherein calculating the total amount of resistance generated by the alignment area includes:

(a) generating a directional friction curve for the alignment area; and

(b) determining the area under the directional friction curve.

12. The method of Claim 11, wherein the directional friction curve is a linear directional friction curve indicative of constant resistance to pointer movement.

13. The method of Claim 11, wherein the directional friction curve is a non-linear directional friction indicating that the resistance to pointer movement depends on the location of the pointer in the alignment area.

14. In a computer device that maintains a graphical user interface that includes a pointer and an alignment area, a method of calculating an adjusted coordinate position where the pointer will intersect the alignment area in response to the pointer being moved to the alignment area comprising:

(a) calculating the coordinate position where the pointer intersects the alignment area; and

(b) for each directional component in the projected movement of the pointer from the current to the projected coordinate positions ("projected movement"):

(i) determining the projected change in pointer location;

(ii) determining an adjustment amount based on the attributes of the alignment area; and

- (iii) reducing the projected change in pointer location by said adjustment amount.

15. The method of Claim 14, wherein calculating the coordinate position where the pointer intersects an alignment area includes:

- (a) identifying the coordinate position occupied by the alignment area;
and
- (b) comparing the coordinate position occupied by the alignment area with the projected movement of the pointer.

16. The method of Claim 14, wherein determining the projected change in pointer location includes:

- (a) calculating the projected movement of the pointer; and
- (b) expressing the projected movement of the pointer as a vector.

17. The method of Claim 14, wherein determining an adjustment amount includes:

- (a) calculating the total amount of resistance generated by the alignment area;
- (b) if the total amount of resistance is larger than the projected change in pointer location, determining that the adjustment amount equals the total amount of resistance; and
- (c) alternatively if the total amount of resistance is not larger than the projected change in pointer location, determining the adjustment amount by calculating the point on a directional friction curve where the projected pointer movement equals the area under the directional friction curve.

18. The method of Claim 17, wherein calculating the total amount of resistance generated by an alignment area includes:

- (a) generating a directional friction curve for the alignment area; and
- (b) determining the area under the directional friction curve.

19. The method of Claim 18, wherein the directional friction curve is a linear directional friction curve indicative of constant resistance to pointer movement.

20. The method of Claim 18, wherein the directional friction curve is a non-linear directional friction indicating that the resistance to pointer movement depends on the location of the pointer in the alignment area.

21. A computer-readable medium containing computer-readable instructions which, when executed by a computer device that includes a display for displaying a graphical user interface including a pointer, a pointer input device and an operating system, performs a method that assists users in aligning a selected object with an object displayed on a graphical user interface, comprising:

- (a) in response to receiving notice of a pointer movement event, obtaining the current and projected coordinate positions of the pointer;
- (b) determining if the pointer will intersect an alignment area during movement;
- (c) if the pointer intersects an alignment area during movement, calculating an adjusted coordinate position for the pointer; and
- (d) replacing the projected coordinate position of the pointer with the adjusted coordinate position.

22. The computer-readable medium of Claim 21 further comprising communicating to the operating system of the computer device that the pointer will achieve an aligned coordinate position if the pointer intersects an alignment area.

23. The computer-readable medium of Claim 21 further comprising displaying the pointer on the display of the computer device at the adjusted coordinate position.

24. The computer-readable medium of Claim 21, wherein the current and projected coordinate positions of the pointer are obtained from the operating system of the computer device.

25. The computer-readable medium of Claim 21, wherein determining if the pointer will intersect an alignment area includes:

- (a) identifying the coordinate positions on the display of the computer device occupied by an alignment area; and
- (b) comparing the coordinate position occupied by the alignment area with the movement of the pointer from the current to the projected coordinate positions.

26. The computer-readable medium of Claim 21, wherein the alignment area that a pointer may intersect is aligned with an object displayed on a graphical user interface.

27. The computer-readable medium of Claim 21, wherein calculating an adjusted coordinate position for the pointer includes;

- (a) calculating the coordinate position where the pointer intersects the alignment area; and
- (b) for each directional component associated with the movement of the pointer from the current to the projected coordinate positions ("projected movement"):
 - (i) determining the projected change in pointer location;
 - (ii) determining an adjustment amount based on attributes of the alignment area; and
 - (iii) reducing the projected change in pointer location by said adjustment amount.

28. The computer-readable medium of Claim 27, wherein calculating the coordinate position where the pointer intersects an alignment area includes:

- (a) identifying the coordinate position occupied by the alignment area; and
- (b) comparing the coordinate position occupied by the alignment area with the projected movement of the pointer.

29. The computer-readable medium of Claim 27, wherein determining the projected change in pointer location:

- (a) calculating the projected movement of the pointer; and
- (b) expressing the projected movement of the pointer as a vector.

30. The computer-readable medium of Claim 27, wherein determining an adjustment amount includes:

- (a) calculating the total amount of resistance generated by the alignment area;
- (b) if the total amount of resistance is larger than the projected change in pointer location, determining that the adjustment amount equals the total amount of resistance; and
- (c) alternatively if the total amount of resistance is not larger than the projected change in pointer location, determining the adjustment amount by calculating the point on a directional friction curve where the projected pointer movement equals the area under the directional friction curve.

31. The computer-readable medium of Claim 30, wherein calculating the total amount of resistance generated by the alignment area includes:

- (a) generating a directional friction curve for the alignment area; and
- (b) determining the area under the directional friction curve.

32. The computer-readable medium of Claim 31, wherein the directional friction curve is a linear directional friction curve indicative of constant resistance to pointer movement.

33. The computer-readable medium of Claim 31, wherein the directional friction curve is a non-linear directional friction indicating that the resistance to pointer movement depends on the location of the pointer in the alignment area.